

# THE HAWAIIAN FORESTER AND AGRICULTURIST

MAY, 1916

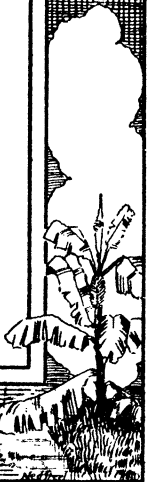
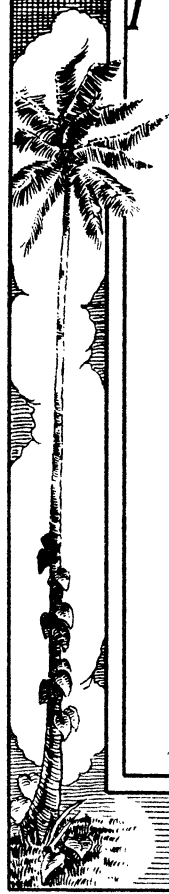
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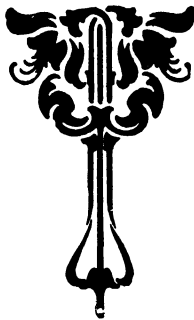
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# The Hawaiian Forester and Agriculturist

A Monthly Magazine of Forestry,  
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Hydrography and Agriculture.

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# Board of Agriculture and Forestry

## DIVISION OF FORESTRY.

### FOREST AND ORNAMENTAL TREE SEED AND SEEDLINGS FOR SALE AT THE GOVERNMENT NURSERY.

The Division of Forestry keeps constantly on hand at the Government Nursery, seed and seedlings of the important native and introduced trees. These are sold at prices just covering the cost of collection or growing.

The list includes both forest and ornamental trees, such as Silk Oak, Koa, various species of Eucalyptus, Golden and Pink Showers, Pride of India, Poinciana, Albizzia, etc. The price of the seed varies from 10 to 50 cents per ounce. The seedlings may be had for 2½ cents each, except a few kinds which are 5 cents. Seed of the various palms is also for sale; the price per 100 varying from \$1.00 to \$2.50. All seed is tested before being sent out, which insures its being good.

All communications in regard to seed or trees should be addressed to David Haughs, Forest Nurseryman, Box 207, Honolulu, Hawaii.

C. S. JUDD,  
Superintendent of Forestry.

## DIVISION OF ENTOMOLOGY.

To give information about insects free of charge is one of the duties of this Division, and Hawaiian readers are hereby invited to make inquiry in person and by mail. In order to be able to advise intelligently or send the right kind of useful insects for relief, we like and sometimes it is indispensable for us to see the insects suspected or caught in the act, also specimens of the injury. In a tin with a hole or two, or a wooden box, specimens may be mailed by parcels post. When specimens are not accompanied by letter always write your name and address in the upper left-hand corner of the package. Address all communications, SUPERINTENDENT DIVISION OF ENTOMOLOGY, P. O. BOX 207, HONOLULU, HAWAII.

EDW. M. EHRHORN,  
Superintendent of Entomology.

## PUBLICATIONS FOR DISTRIBUTION.

The Board of Commissioners issues for general distribution to persons in the Territory, annual reports, bulletins, circulars, copies of its rules and regulations, and other occasional papers, which may be had, free, upon application.

A complete list of the publications of the Board available for distribution (together with the titles of certain issues now out of print) is to be found on the cover of the last biennial report.

Applications for publications should be addressed to the Mailing Clerk, P. O. Box 207, Honolulu, Hawaii.

## DIVISION OF HYDROGRAPHY.

Rooms 17-22 Kapiolani Bldg. Tel. No. 3662.

The Division of Hydrography has on hand free publications relative to the water resources of the Hawaiian Islands. These publications furnish detailed data as to daily, monthly, mean, maximum, and minimum run-off of streams and ditches, and also cuts and maps pertaining to the different islands. These publications will be mailed free of charge on request.

The records and maps of this Division are available for inspection by any one who desires information relative to water resources, topography, etc. Blue print copies of hydrographic data relative to any stream, ditch, spring, etc., which may be under observation by this Division will be mailed free of charge on request.

G. K. LARRISON,  
Superintendent of Hydrography.

# THE HAWAIIAN FORESTER AND AGRICULTURIST

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VOL. XIII.

HONOLULU, MAY, 1916.

No. 5

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Importers of seed and other plant products from foreign countries would do well to read Superintendent Ehrhorn's article in this issue bearing on this subject, in order not to be disappointed in making the mistake of ordering such material by mail.

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The fencing work of the Division of Forestry is progressing satisfactorily. This includes not only the construction of new fences on Kauai and Hawaii, but also the repairing of forest reserve boundary fences on Kauai, Hawaii and Oahu.

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Field Entomologist D. T. Fullaway is expected back from Manila on May 6 with parasites on the melon fly, which he secured in India.

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Returns from tree planters show that 862,364 trees were set out on the different islands during the calendar year 1915. It is possible that a total of one million trees was actually planted, since it is difficult to get all tree planters to send in their returns.

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Rule II of the Division of Forestry is an essential step in the progress of forest administration in the Territory and will undoubtedly benefit the forest reserves by the authority for their protection, which the rule gives.

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The bettering of the quality of Honolulu's water in Nuuanu Valley is the object of Rule III of the Division of Forestry, which was recently passed by the Board and approved by the Governor.

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The Division of Forestry is having difficulty in finding enough koa seed to continue the planting operations on the Makiki hills, and is willing to pay as high as \$4.00 per pound for good, clean koa seeds which are free from insects.

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The Deputy Territorial Veterinarian for Maui, Dr. J. C. Fitzgerald, was on March 30 delegated by the Board to serve on the Fair Committee for the County of Maui, which is to proceed to organize, promote, and arrange for the holding of a County Fair on Maui some time during the coming summer or fall.

Attention is called to the article in this number by Territorial Veterinarian Nörsgaard on the treatment of chickens and other poultry for sorehead, and the offer of assistance to poultry raisers. This treatment has already been tried in the Territory with successful results, and it is hoped that it will be universally adopted, and that poultry raising will thereby receive an impetus. Extra reprints of this article may be obtained on application to the Board.

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## Proposed New Forest Reserve

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The Governor has given notice of a hearing at 2 p. m., April 24, 1916, at the Government Nursery, King street, Honolulu, at which time and place evidence and arguments either for or against the setting apart of an unleased government remnant of land in Manoa Valley, Oahu, called Kahoiwai, as a forest reserve, to be called the "Manoa Ranger Station" will be considered.

The land recommended for this purpose by the Superintendent of Forestry, and approved by the Board, consists of 15.36 acres and is a narrow strip running from near the Manoa stream up to the top of a steep hill. The lower part of the land is somewhat swampy and the cultivation of bananas on it has been attempted without any great success because of the coldness of the soil. The upper portion is covered with a splendid grove of koa and other native forest trees, which are well worth protecting.

The steep, open land on this proposed new reserve affords a suitable place for the experimental planting of many introduced trees which the Division of Forestry has on hand, but which have not as yet been set out as a forest community. Because of its central location in Manoa Valley, the land also affords an excellent site for the headquarters of the Forest Ranger, who is posted in the valley to watch out for forest and grass fires, and prevent trespass on the government lands in the Honolulu Watershed Forest Reserve.

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Shipments of honey to the States last year amounted to more than \$40,000, a moderate increase over each of the two previous years.

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Meat and dairy products imported from the mainland last year were valued at \$1,286,823, or about \$175,000 more than in 1914, but nearly \$88,000 less than in 1913.

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Hawaii's imports of vegetables from the mainland amount to from \$350,000 to \$500,000 a year. No doubt much of this could be saved by the development of home production.

## New Rules and Regulations for the Division of Forestry

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The new rules and regulations for the Division of Forestry have recently been passed by the Board and approved by the Governor. These appear on the By Authority page of the present issue of the FORESTER.

Rule II covers the protection and administration of forest reserves in general. While the law gives the Board full power to make rules and regulations for the protection and administration of forest reserves, no rule, excepting Rule I which concerns grass cutting in the Honolulu Watershed Forest Reserve and is only of local application, had been passed by the Board so that in the administration of forest reserves in the past the Division of Forestry had practically been without authority from a definite rule and regulation. Rule II was, therefore, prepared by the Superintendent of Forestry after a careful study of the necessary points to be covered in the administration and protection of government lands in the Territorial forest reserves. Many of the provisions of this rule have been taken from the regulations of the United States Forest Service, which have been tried out for many years on the 150 million acres of National Forest land all over the United States, and have proved satisfactory.

The object of Rule II is to prevent acts which are detrimental to the property of the Territory and to the health of the community, and none of its provisions will be found hard to comply with by any public-spirited citizen.

Rule III is of local interest and concerns the purity of that part of Honolulu's water supply which comes from upper Nuuanu Valley in the Honolulu Watershed Forest Reserve. In itself, this rule will not insure the absolute purity of the water in the reservoirs, because a filtration plant and keeping road drainage from the reservoirs are also necessary for this desired end. The enforcement of this rule will, however, be a great help in removing the danger of water pollution by human beings and wandering animals who in the past have not kept off the areas draining into the upper three Nuuanu reservoirs, in spite of the "keep off" signs which have been placed there in the past. Since the area concerned is a part of the Honolulu Watershed Forest Reserve, and therefore under the control of the Board of Agriculture and Forestry, it is only logical that this Board should take this step in the effort to insure pure water.

The area on which trespassing by the general public is forbidden by the rule, has been confined to the smallest possible limits, and includes only the lands which drain into the upper three reservoirs and the intake just above the Luakaha falls.

To be sure, this rule will eliminate some of the favorite routes of trampers in our mountains who may feel that they have been unjustly deprived of visitations to their accustomed haunts. On the other hand, they should consider the health of the community above their own personal pleasure and recreational delight, and if they have the proper public spirit they should be eager to coöperate with the Division of Forestry in preventing any violation of this rule.

This rule has been published in Japanese, Chinese, Hawaiian and Portuguese, as well as in the English papers of Honolulu, since it is applicable to all alike and it has the full force and effect of law. This rule, as well as Rule II, which has also been approved by the Governor and published, is a preventive measure in which all law-abiding residents should be interested and should desire to coöperate in observing.

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Agricultural implements imported to Hawaii from the mainland last year were valued at \$48,306, which was about \$28,500 more than in 1914, but only \$5,000 more than in the year before.

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Breadstuffs and animal feed other than hay, etc., were imported from the mainland last year to the value of \$2,542,001, which is about \$210,000 gain over 1914, but \$90,000 odd decline from 1913.

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Hawaii imported from the States last year live stock, including fowls, to the value of \$194,400. While this was \$90,000 more than the previous year's, it was about \$163,600 less than 1913 imports.

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According to a statement by the Portland office of the federal forest service, the various field parties in Oregon and Washington last field season covered 88,000 acres, mapping the topography on a scale of four inches to the mile, and estimating the timber by taking an actual tally of ten per cent of the trees.

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Champion milch cows are recorded by the Ayrshire Breeders' Association, with headquarters at Brandon, Vt., as follows: "The senior four-year-old, August Lassie, 29581, A. R. 1429, bred and owned by L. A. Reymann Estate, Wheeling, West Va., has just closed her year of official testing, with a record of 17,784 lbs. milk, 720.03 lbs. fat, 840 lbs. butter, 4.05 per cent fat, which places her the world's champion in her class. The junior two-year-old, Willowmoor Etta 3d, 35833, A. R. 1691, bred and owned by J. W. Clise, Redmond, Washington, has just closed her year of official testing, with a record of 16,621 lbs. milk, 666.06 lbs. fat, 784 lbs. butter, 4.01 per cent fat, which places her the world's champion junior two-year-old."



# Mail Importations of Plants and Seeds From Foreign Countries

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By E. M. EHRHORN, *Superintendent of Entomology.*

For the information of the public it is necessary again to call attention to the rules and regulations of the Federal Horticultural Board of the U. S. Department of Agriculture, concerning the sending of plants and seeds into the United States through the mails from foreign countries.

An order issued as far back as December 16, 1913, by the Second Assistant Postmaster General, prohibits the importation into the United States from foreign countries through the mails, of all plants and plant products for propagation, including seeds, except field, vegetable and flower seeds. This prohibition, therefore, applies to bulbs, roots and tubers, and to all seeds of trees, palms, shrubs or other plants. It excepts only field, vegetable and flower seeds, including rice, alfalfa, sorghum, panicum and other field seeds; lettuce, cabbage, radish, onion and other vegetable seeds; and pansy, sweetpea, carnation and other flower seeds, which may be imported from foreign countries by mail.

Cotton seed, which would be rated as a field seed, is, however, forbidden entry into the United States from *any* foreign country, except from certain states in Mexico, either by mail or any other carrier; nor can cotton seed be sent from Hawaii into any part or even through the United States.

Therefore, under the order issued by the Second Assistant Postmaster General, all nursery stock and other plant products, including orchids and tree seeds, except as noted, which are received in the mails from foreign countries, will be returned by the postmaster at Honolulu, as prohibited, to the country and place of origin.

This order, therefore, restricts the carriage of such products from foreign countries to other means of conveyance, such as by express or freight.

Importations by these methods pass through the Customs' office in the normal way, and are under complete control by them and the plant quarantine service.

The reason for this order should be apparent to all. The possibility of transmitting many injurious insects and plant diseases in packages of plants and seeds sent through the mails has been proved, and the thorough inspection of such mail matter is almost an impossibility, unless the department is furnished with an army of men, which is out of the question. On the other hand, consignments of seed and other plant products sent by express or freight are more readily examined by the inspector, hence the exception to this rule.

## Division of Forestry

Honolulu, Hawaii, March 18, 1916.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, Hawaii.

Gentlemen:—I respectfully submit the following routine report of the Division of Forestry for the month of February, 1916:

### *Forest Fencing.*

The work of forest protection by constructing new fences and repairing existing barriers to stock along the forest boundaries continues to be one of the chief activities of this Division. During February, the new fence along 2.73 miles of the boundaries of the Kealia and Moloaa Forest Reserve, Kauai, which Forest Ranger Lovell has been constructing for the past few months with the assistance of a few laborers, was completed at a cost of approximately \$375 per mile. This new fence closes up a gap which has existed on the boundaries of the reserves in this region and will afford complete protection to the government forest lands of Anahola and Aliomanu, parts of which were formerly overrun with cattle.

The heavy wind storm in January blew over several trees in the koa grove reserve at 29 miles on the Volcano Road, Hawaii, which damaged the woven wire fence which had recently been constructed around this reserve. During the month this damage was repaired by the contractor who built the original fence.

In coöperation with the ranch department of the O. R. & L. Co., work has begun during the month on necessary repairs to the boundary fences on both sides of the Pupukea Forest Reserve, Oahu, where the wire had rusted out and some of the posts needed resetting. This Division furnished 28 coils of wire and 1 keg of staples for the work.

Other fencing work to be begun shortly will be the construction of 5.61 miles of new fence around Section A of the Olaa Forest Park Reserve on the Volcano Road, Hawaii, and necessary repairs to the Lualualei Forest Reserve boundary fence, on Oahu.

### *Forest Reserve Monuments.*

In order to familiarize the public with the boundaries of forest reserves, I have undertaken to erect the standard forest reserve monuments which this Division has on hand at conspicuous places on forest reserve boundaries. One of these was placed in Nuuanu

Valley on the right hand side of the road as one goes toward the Pali just mauka of where the new road turns off from the old. Another was placed on the boundary line in the bottom of Pauoa Valley. In locating the latter it was found that a Japanese, one Sora Sakido, had about a year ago moved his house from low land on the Booth Estate, a parcel of which he rents for the purpose of raising violets, to higher land and, not knowing the boundaries, had inadvertently built a part of it on a few square feet of government land at the very corner of the reserve. The Japanese, who makes a scanty living from his violets, gets no return from the use of these few square feet of government land but, in order to legitimize his occupancy, I propose to issue him a temporary permit for the use of this land, to be renewed quarterly subject to his compliance with our rules, and require him to pay rental at the rate of \$3.00 per year.

#### *Protection of Nuuanu Reservoir Region.*

During the month I have studied the subject of how better protection could be afforded to the land draining into the three upper reservoirs in Nuuanu Valley, which are within the Honolulu Watershed Forest Reserve, and more particularly with respect to how trespassers may be kept out. This is an essential step concomitant with the desirability of the establishing of a filtration plant and preventing road seepage from draining into the reservoirs. Visits were made to the land with representatives of the Board of Health and of the Survey Office and I have prepared and am submitting to you, with a special report, for approval, a new rule creating a tabu on a part of this Forest Reserve.

#### *Inspection of Planting.*

On February 16, the Forest Nurseryman and I inspected the experimental planting of 500 Ironwood trees done for this Division by Mr. Mark Robinson on one of the water reserves in the Pupukea Forest Reserve, Oahu, and found the trees to be growing in a satisfactory manner. On our way back, an inspection of the lemon gum and swamp mahogany trees planted by Manager A. A. Wilson around the Wahiawa reservoir disclosed the success which he has obtained from his initial plantings.

In this connection you may be interested to know that the returns of trees planted during the calendar year 1915 are now in and show a total of 862,364. Of this number 83 per cent were planted by sugar plantation companies.

*Introduced Trees.*

Mr. J. F. Rock, the Consulting Botanist of the Board, has identified and prepared a list of 145 of the trees and other plants growing in the grounds of Mrs. Mary E. Foster on Nuuanu Avenue, most of which were introduced by Dr. William Hillebrand from all parts of the world and include many beautiful and rare flowering trees not as yet planted elsewhere in the Territory. Mr. Rock's article with four illustrations will appear in the April issue of THE HAWAIIAN FORESTER AND AGRICULTURIST."

*Visit of Mr. A. F. Fischer.*

During the month it was my pleasure to receive a visit from Mr. A. F. Fischer, Assistant Director of the Bureau of Forestry in the Philippine Islands, who was on his way back to Manila from San Francisco, where he had been in charge of the excellent Philippine forestry exhibit at the exposition. From Mr. Fischer, with whom I compared notes on forest conditions in our respective countries, I obtained a good deal of useful information and arranged with him for exchanges which will be valuable to both archipelagos.

Respectfully submitted,

C. S. JUDD,  
Superintendent of Forestry.

## REPORT OF FOREST NURSERYMAN.

Honolulu, Hawaii, March 16, 1916.

Superintendent of Forestry,  
Board of Agriculture and Forestry,  
Honolulu.

Dear Sir:—I herewith submit a report of the principal work done during the month of February, 1916:

*Nursery.*

## Distribution of Plants.

	In seed boxes	In boxes transplanted	Pot grown	Total
Sold . . . . .	50	122	172	
Gratis . . . . .	4000	150	314	4464
	<hr/> 4000	<hr/> 200	<hr/> 436	<hr/> 4636

*Collections.*

Collections on account of plants sold amounted to \$14.75.

*Collection and Exchange of Seed.*

The two boys have been kept busy collecting seed in and around the city. The seeding season for most of the flowering trees and some of the forest trees is just coming in. Consequently we will be busy for some time to come in getting up as large a collection of fresh seed as possible.

We have received from the Royal Botanic Gardens, Sibpur, near Calcutta, a package containing four species of *Ficus*, three of which as far as I am aware, are new to the Islands. From the Royal Botanic Gardens, Peradeniya, we received two packages of grass seed, and from the Forest Department, Nairobi, British East Africa, a list of plants and seed available for exchange with a request that our list of seed be forwarded to them. Our list will be forwarded in a few days.

*Plantation Companies and Other Corporations.*

Under this heading the following trees were distributed: 5500 in seed boxes, 4700 in transplant boxes and 402 pot grown. Total, 10,602.

*Makiki Station.*

The work at this station has been directed towards the increasing of our stock and doing other routine work.

*Honolulu Watershed Planting.*

The work done during the month consisted of rooting out the spiny shrub (*Caesalpinia bonduc*) in the lower end of Hering Valley, also hoeing and clearing away weeds from the trees recently planted.

*Advice and Assistance.*

The writer has made visits and otherwise given advice and assistance at the request of people in and around the city, as follows:

Visits . . . . .	10
Advice by telephone . . . . .	15
Advice by letter . . . . .	6
Advice given to people calling . . . . .	14
Total . . . . .	45

Respectfully submitted,

DAVID HAUGHS,  
Forest Nurseryman.

## Division of Entomology

Honolulu, Hawaii, March 13, 1916.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, Hawaii.

Gentlemen:—I respectfully submit my report of the work performed by the Division of Entomology for the month of February, 1916, as follows:

During the month there arrived at the Port of Honolulu 34 vessels, of which 22 brought vegetable matter. One vessel arrived from the Canal Zone.

<i>Disposal</i>	<i>Lots</i>	<i>Parcels</i>
Passed as free from pests.....	905	15,693
Fumigated . . . . .	7	73
Destroyed . . . . .	53	55
Returned . . . . .	2	2
Total inspected . . . . .	967	15,823

Of these shipments 15,537 arrived as freight, 164 packages as mail matter and 122 packages as baggage of passengers and immigrants.

### *Rice and Bean Shipments.*

During the month 11,472 bags of rice and 1904 bags of beans arrived from Oriental ports, also 2 bags of corn, all of which were carefully inspected and passed as free from pests.

### *Pests Intercepted.*

Approximately 1913 pieces of baggage from foreign ports were examined during the month and 50 lots of fruit were found and destroyed by burning.

One case of Orchids from Balboa, Panama, was fumigated on account of a slight infestation of scale (*Aspidiotus cyano-phylli*) and a nest of ants.

Another package of plants from the same place was also fumigated and some hibiscus cuttings infested with *Diaspis pentagona* were burned.

Two small orange trees and a package of citrus seeds found in baggage from Japan were seized and destroyed, no citrus stock or seed being permitted to enter the United States from a foreign

port under a ruling of the Federal Horticultural Board, Washington, D. C.

Two packages of corn from Guam were fumigated with carbon-bisulphide before delivery.

One package of beans from Italy was found in the mail and being infested with the pea weevil (*Bruchus pisorum*) was fumigated with carbon-bisulphide before delivery.

One package of tree seeds from India consigned to J. F. Rock, collaborator of the U. S. Department of Agriculture, was fumigated as a precautionary measure before delivery.

One Yew tree, in baggage from Japan, was fumigated and is held in quarantine pending further investigation. We have also two flowering cherry trees which have been treated in the same manner.

A package of Pongee silkworm cocoons arrived by mail from Japan and were turned over to us by the consignee. They have been reared to the adult stage and these have been killed and kept for the museum and collection.

Two packages of tree seeds from foreign countries were returned to original sender by the post office authorities.

Two lots of beneficial insects arrived addressed to the superintendent who turned them over to the Hawaiian Sugar Planters' Association after going over the material carefully with Mr. O. H. Swezey. All soil and packing in these shipments is destroyed by burning.

#### *Beneficial Insects.*

During the month of February the following parasites of Fruit-flies have been bred:

Tetrastichus giffardii.....	9250
Diachasma fullawayi.....	231
Diachasma tryoni.....	177

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Total bred.....9658

The following parasites, including those reared for Horn, House and Stable flies, were liberated during the month:

Tetrastichus giffardii.....	6000
Diachasma fullawayi.....	209
Diachasma tryoni.....	164
Galesus silvestrii.....	250
Dirhinus giffardii.....	150
African spalangia.....	300
Philippine spalangia.....	300
African hornfly parasite.....	500

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Total parasites liberated.....7873

From the material we received from the California State Insectary containing parasites of the Mealybug, we were very successful in rearing a large quantity of parasites (*Paraleptomastix abnormis*). Some of these have been placed in breeding cages for further multiplication and we were able to liberate 1522 in various places where the Citrus mealy bug was found. It is unfortunate that this species will not attack the Alligator pear mealy bug (*Pseudococcus nipae*) as this is the worst species we have in the Islands. Many of our Ladybugs have reduced other species so that we rarely have complaint of their damage. They also make inroads on the species attacking the Alligator pear and other plants, but not to a great extent. As the new parasite is more inclined to attack the citrus mealybug and as this pest is not very abundant on account of Ladybug attack, it will be difficult to say whether or not we shall be successful in establishing it here. We have also other Hymenopterous parasites attacking Mealybugs so that we are perhaps well protected on certain species but we should try to get a specific parasite for the species attacking the Alligator pear, Fig, Guava and many other plants as the damage done to new growth and blossoms by this species is very serious.

Some very encouraging letters have been received from Mr. D. T. Fullaway, who is now at Manila, where he is breeding up an *Opius* species parasitic on the Melon fly (*Bactrocera cucurbitae*). He seems very much encouraged by the results he has obtained there and hopes soon to be able to return here with a good supply for propagation.

We are now planting some *Momordica charantia*, a Chinese gourd, as well as Cucumber seeds at intervals, so as to have plenty of infested material ready for him when he arrives.

Owing to the scarcity of fruit, we have been breeding the various fruit fly parasites on a limited scale only. In fact our main endeavor is to keep alive all the species which have been introduced including the species for Horn, House and Stable fly until such time when we can be satisfied that they are well established in the field. As it is now we have taken all except two species in the field and these two species, *Galesus silvestrii* and *Dirhinus giffardii*, have been distributed by thousands under the most favorable circumstances and yet we have not recovered either species from material collected in the open. Our recovery of the small species, *Tetrastichus giffardii*, from material collected in the field is encouraging, although not as yet sufficient to say definitely that the species is established, but of the other species our findings give us some hope that they are fairly well established.



*Hilo Inspection.*

Brother M. Newell reports the arrival of seven steamers, six of which brought vegetable matter consisting of 154 lots and 3248 packages, all of which was found free from pests and diseases. During the month the "Kiyo Maru" arrived direct from Japan, bringing 3460 bags of rice and 151 bags of beans, which, after a thorough inspection, was found free from infestation and was passed.

*Inter-Island Inspection.*

Fifty-eight steamers plying between the port of Honolulu and ports on the other islands were attended to during the month. The following shipments were passed:

Taro . . . . .	545 bags
Plants . . . . .	50 packages
Vegetables . . . . .	74 packages
<hr/>	
Total passed . . . . .	669 packages

The following packages were refused shipment as they did not pass the regulations pertaining to soil and infestation:

Plants . . . . .	4 packages
Fruits . . . . .	14 packages
<hr/>	
Total refused shipment . . . . .	17 packages

Respectfully submitted,

E. M. EHRHORN,  
Superintendent of Entomology.

That it pays to raise good stock is illustrated by the experience of two Utah ranchmen who sent their steers to the same market on the same day. Both ran their stock on national forest range under grazing permits, both used the same amount of range per head of stock, and both paid the same grazing fee. One gave close attention to the selection of his breeding cows and used only high-grade bulls. The other made no effort to improve his herd. The owner of the high-grade stock received \$40 per head more for his steers than the owner of the common stock. On some of the national forest ranges the stockmen club together, it is reported, and buy high-grade bulls which are owned as community property.

## Division of Animal Industry

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Honolulu, Hawaii, March 28, 1916.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, Hawaii.

Gentlemen:—I have the honor to submit herewith my report for the Division of Animal Industry for the month of February, 1916:

### *Quarantine Station.*

The prolonged period of inclement weather during the latter part of last year and the beginning of this put the Animal Quarantine Station on the Beach Road to a severe test. The heavy downpour at times flooded nearly all the paddocks for large animals and only the concrete construction in the dog kennels saved these from inundation. When the rains subsided it was found that extensive cave-ins had taken place in nearly all the paddocks, due undoubtedly to subterranean outlets for the surface water that filters to them through the sand. As these cave-ins and sunken areas had to be filled in, arrangements were made with a local contractor to deliver and apply the necessary filling—clean sand—in return for accumulated manure, on an equitable basis. In this manner nearly two hundred small loads of sand (the softened condition of the ground allowed of only one cubic yard of sand to the load) have been exchanged for about 125 loads of manure and surface scrapings, and the Station put in first class condition without cost to the Board.

A number of the large algaroba trees were lost during the February storm, but these have now been replaced by fast growing shade trees supplied by the Division of Forestry. Only one of the smallest kennels was damaged by the fallen trees besides which the entire station needs repainting. This will be attended to as soon as the weather permits, there being on hand a considerable supply of shingle stain as well as the crude oil required for the posts.

In spite of the unfavorable conditions above described the general health of the quarantined animals has been excellent. The dog kennels have been nearly full throughout the winter months and it must be considered very fortunate that no epidemic made its appearance. Twice it was found that distemper was about to break out but in both cases the disease was checked and only one dog was lost, an English bull which arrived here with running eyes. This animal, in spite of every effort, became almost totally blind and finally died from the nervous form of distemper.

Only one other dog, a valuable Boston bull terrier, died from heart failure. This animal had been in excellent health up to a few minutes before death. The keeper of the station was at the time distributing the evening meal and all the dogs were, as usual, more or less excited. The dog in question was also dancing around and barking when suddenly it rolled over, frothing at the mouth, and was dead in a few minutes. A post-mortem examination showed valvular insufficiency in both sides of the heart, so the dog could, at the very best, have lived but a short time. This condition is very common among well bred dogs, some authorities placing it as high as five per cent in all well bred dogs of the pet or toy varieties, the symptoms, especially when death does not occur quite so sudden, frequently being mistaken for rabies in countries where the disease occurs. This is the third case observed at this station, the two former ones happening immediately after the victims had been visited by their respective owners, for which reason such visits are discouraged as much as possible.

#### *Bovine Tuberculosis Control Work.*

As shown by the appended report of the Assistant Territorial Veterinarian, a recent test of the Waialae Ranch dairy herd shows a relapse which would be highly discouraging were it not for the fact that the probable cause of the same may be eliminated. The previous test of this same herd showed a reduction in the number of tuberculous reactors to nearly one-half of one per cent and great hopes were entertained that the disease was now near complete eradication. It will be remembered that this herd, the largest dairy herd in the county, showed an original infection in the neighborhood of 70 per cent. The owner has labored assiduously at the suppression of the disease and has assisted this Division in every way to this end. But nevertheless the repeated recrudescence of the disease every time when it was practically eradicated, finally led to the conclusion that extraneous infection might, to some extent at least, be the cause thereof and inquiries led to the discovery that a neighboring herd of beef cattle seems to be more or less infected with tuberculosis. Whether beef cattle, or in other words, cattle from which no milk is sold or used for human consumption, under the regulations now in force here, can be dealt with as a center of infection, pure and simple, is a question which must be decided before action can be taken. The fact that bovine tuberculosis, until quite recently, has not been considered or dealt with as a dangerously infectious disease—except when milk from tuberculous cows was concerned—would make a legal decision of the question of the local authorities' right to interfere, without the owner's consent, of doubtful value. It has therefore been found

advisable to await the return to Honolulu of the owner of the above mentioned dairy herd, when action will be taken by him and other dairy men in his neighborhood, to ascertain exactly what can be done in the premises.

In the meantime the annual test is being continued with very satisfactory results among which may be mentioned the fact that the Mokuleia herd, of 448 dairy animals, reported as injected (in Dr. Case's report) gave only one single reactor and that a great majority of the smaller dairies are found absolutely free of the infection.

### *Hog Cholera.*

The outbreak mentioned in my report for January as occurring at Puuloa, and which undoubtedly was complicated with salt poisoning, if not entirely due to it, has subsided. A recent outbreak at Mills School, Manoa, was treated with the serum-simultaneous method, the virus being obtained from one of the sick animals on the premises. The results were very satisfactory and will be watched with interest in order to ascertain the length of immunity conferred by this method. A more recent outbreak in the Kapahulu district was treated with the serum alone, but some very sick, and therefore untreated hogs were left with the serum treated ones for the same purpose.

Having read the replies received from the hog raisers to whom copies of the proposed Rule IX were sent, it appears to me advisable that the same be promulgated. With some slight changes in the wording of the section pertaining to the quarantine of infected premises, the printed rule might be made to work automatically as an order to quarantine, when handed to the owner and receipted for. This would obviate the necessity of having special quarantine orders prepared and would simplify the matter considerably.

On the island of Maui a hui of hog raisers have imported 50,000 c.c. of hog cholera serum and placed the same in charge of the deputy territorial veterinarian. Only three outbreaks occurred there during 1915 and all were promptly checked by the use of serum alone.

The Hilo deputy was provided with 1000 c.c. of the serum kept here by the Board, in order to be prepared for eventual outbreaks.

### *Glanders.*

This disease, undoubtedly a relic from the Waipio Valley outbreak in 1911, has made its appearance in Kohala, Hawaii, a mare with a mule colt being reported as suffering from glanders by the local veterinarian, Dr. Rowat. By direction of the Executive Officer, Dr. Elliot went at once from Hilo to Kohala and,

having confirmed Dr. Rowat's diagnosis, had both animals killed and the premises disinfected. Since that time Dr. Rowat found one more case in a neighboring stable, which likewise was destroyed. While there is no serious cause for alarm, the desirability of having a deputy territorial veterinarian in that district becomes manifest. It is, of course, almost impossible for one veterinarian, single handed, to cover an island the size of Hawaii and it is not pleasant to contemplate what might have occurred had Dr. Rowat not been there and located this outbreak while still in its incipency. If, therefore, the plantation and ranch interests in that neighborhood should unite on recommending the appointment of a deputy for the district, it would undoubtedly become advisable for the Board to coöperate with them in providing for a good man to look after the live stock in Kohala as well as in North and South Kona.

#### *Chicken Pox or Sore Head.*

A number of small outbreaks have occurred, and where fresh untreated scabs have been secured the results have been good. Where the sores have been treated, and especially with tincture of iodine, the scabs are of no value for the preparation of vaccine. A number of inquiries have been received from both Hawaii and Maui in regard to this treatment, and the information received that of all the chickens hatched during or after June of each year, about 90 per cent die from sore head. On a recent visit to the Haiku district on Maui (March 19) a demonstration was made of the preparation and injection of the vaccine before some 25 or 30 poultry raisers, all of whom expressed the desire to take up poultry farming on a large scale as soon as convinced that this disease can be cured and prevented by this method.

#### *Importation of Live Stock.*

Unusually heavy shipments of livestock were received during the month of February, among which may be mentioned nearly 100 head of mules, 16 registered dairy animals and 175 crates of poultry.

Very respectfully,

VICTOR A. NÖRGAARD,  
Territorial Veterinarian.

## REPORT OF ASSISTANT TERRITORIAL VETERINARIAN.

Honolulu, Hawaii, March 28, 1916.

Dr. Victor A. Nørgaard,  
 Chief of Division of Animal Industry,  
 Board of Agriculture and Forestry,  
 Honolulu, Hawaii.

Sir:—I beg to submit the following report for the month of February, 1916:

*Tuberculosis Control.*

The following dairy cattle were tested:

	T.	P.	C.
Waialae Ranch .....	462	445	17
M. Quintal .....	2	2	0
W. G. Hall.....	5	3	0
Kamehameha Schools.....	2	2	0

A total of 469 head were tested, out of which number 452 were passed and 17 condemned and slaughtered. Besides the above 448 head were injected at W. E. Bellina's ranch at Mokuieia, the results of which will appear in the March report.

*Importations of Live Stock.*

Matsonia, San Francisco—41 crates poultry, various; 2 crates quail, Wells, Fargo Express Co.

Great Northern, San Francisco—1 dog, Mrs. W. Vierra.

Makura, Sydney—1 dog, Stanley Thomas.

Lurline, San Francisco—30 miles, Alexander & Baldwin; 25 mules, Schuman Carriage Co.; 12 mules, H. Hackfeld & Co.; 3 Duroc jersey hogs and 1 litter of pigs, Lahainaluna School; 11 Holstein cows, 1 Holstein calf, 2 Holstein bulls, Hind, Rolph & Co.; 38 crates poultry.

Sierra, San Francisco—1 dog, Lt. E. C. Ramsey.

Wilhelmina, San Francisco—1 live bear, Bud White; 29 crates poultry.

Manoa, San Francisco—17 crates poultry.

Northern Pacific, San Francisco—21 crates poultry, Ter. Marketing Division.

Alaskan, Seattle—2 Ayreshire bulls, H. P. Faye; 25 mules, A. L. Macpherson.

Manoa, San Francisco—17 crates poultry; 1 crate rabbits, Mrs. J. Santos.

Respectfully submitted,

L. N. CASE,  
 Assistant Territorial Veterinarian.

## Division of Hydrography

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Honolulu, Hawaii, March 8, 1916.

Board of Commissioners of Agriculture and Forestry,  
Honolulu, Hawaii.

Gentlemen:—The following report of operations of the Division of Hydrography during February, 1916, is submitted:

### *Weather Conditions.*

During the first week of the month abundant rains fell on Kauai, Oahu, and part of East Maui. Elsewhere the precipitation was light. During the remainder of the month the rainfall was very light and crops and vegetation are beginning to show the effect of dry weather. The rainfall at the Nuuanu Pali gap was less than four inches in February against 31.2 inches in January.

### *Construction Work.*

The construction work planned for the biennial period ending June 30, 1917, was completed. Two new continuous record stream measurement stations were completed during the month on the Ukumehame and Lahainaluna streams on Maui, and the channel cross sections of the three new stations on the main branches of the Waimea stream on Kauai were cleared of bowlders and debris deposited by the December and January storms.

### *Special Report.*

A special and confidential report relative to government water valuation was furnished the Governor of Hawaii at his request.

### *Police Work.*

W. V. Hardy, Assistant Engineer, in charge of the work on Kauai reports under date of February 29, 1916:

"Our camp on the Koaie stream was visited one evening last week by a courier who reported that a Japanese who was supposed to be demented was roaming the hills near the Waiahulu Stream measurement station. The next morning at sunrise the entire hydrographic force turned out, captured the Japanese, turned him over to the proper authorities and were back at work on the Koaie measurement station at 10:30 a. m. It is reported that the man is improving and will probably recover."

*1915 Rainfall Records.*

Almost complete rainfall records for the calendar year 1915 show that, except for the high levels of Kauai, 1915 was a much drier year than 1914. The generally heavy rainfall for December, 1915, in many cases at comparatively low levels, exceeded the total precipitation for the other eleven months.

The accompanying tabulation shows interesting records for 1914 and 1915 for part of the data received.

*Operation and Maintenance Work.*

*Kauai.*—Three new ditch measurement stations were established and one discontinued. Nineteen stream and ditch measurement stations were visited and seven regular station and three miscellaneous measurements were made. About twelve days were spent collecting and preparing data for the biennial report and a considerable amount of trail improvement work was done.

*Oahu.*—Fifty-one visits were made to stream and ditch measurement stations and five rainfall measurement stations were visited. Thirty-one stream and ditch measurements were made. The Kalihi, Punaluu, and Kaluanui stream measurement stations were repaired.

*Maui.*—G. K. Larrison spent the first five days of the month on West Maui, inspecting stations damaged by the January floods, and on reconnaissance of the Olowalu, Ukumehame, Lahainaluna and Kahoma streams.

All continuous record measurement stations and one rainfall measurement station were visited.

Very respectfully,

G. K. LARRISON,  
Superintendent of Hydrography.

## RAINFALL RECORDS FOR 1914 AND 1915.

*Kauai.*

Location	Elevation Feet	Rainfall in Inch.	
		1914	1915
Mt. Waialeale.....	5075	610*	590*
Keanakua ridge.....	4450	110	128
Kohua-Kekoha ridge.....	3950	118	103
Lehuamakanoi ridge.....	3930	147	145
Kahana ridge.....	3750	92.2	99.5
Paukahana ridge.....	3720	85.4	96.2

\* Partially estimated.



Location	Elevation	Rainfall in Inch.	
	Feet	1914	1915
Kaholuamanu ridge.....	3650	65.4	66.9
Waialae valley.....	3600	90.8	103.8
Kokee valley.....	3550	66.0	56.0
Puu Lua.....	3500	48.3	50.4
Upper Mohihi ridge.....	3500	95.7	93.6
Waiakoali ridge.....	3450	86.8	88.9
Upper Olokele ridge.....	2100	145	133
Upper Hanapepe ridge.....	2080	258	247
Hanapepe canyon.....	530	137	130
Waiahi.....	600	118	102
Waimea village.....	10	24.5	13.4
Grove Farm.....	400	79.0	70.1
North Wailua valley.....	650	....	114.2
Mr. Newlun's residence, near Kealia..	375	103.1	99.9
Kilauea.....	325	92.9	66.1

*Oahu.*

Location	Elevation	Rainfall in Inch.		
	Feet	1913	1914	1915
Nuuanu Pali.....	1200	110	138	138
Luakaha (Reservoir No. 4).....	1125	158	199	178
Luakaha.....	850	143	172	159
Wahiawa.....	950	...	41.2	50.6
North Fork Kaukonahua (above Wahiawa).....	1250	...	332	206
South Fork Kaukonahua (above Wahiawa).....	1100	...	...	101
Makaha valley.....	1400	...	...	74.2

*Maui.*

Location	Elevation	Rainfall in Inch.	
	Feet	1914	1915
Mt. Eke.....	4500	303	210
Kukui ridge.....	4300	431	289
Kukui slope.....	2350	155	100
Honokohau (Puu Uau).....	2300	224	144
Keanae.....	1000	397	240

*Hawaii.*

Upper Kawainui.....	4080	504	215
Lower Kawainui.....	1040	308	154
Alakahi (lower ditch).....	1030	240	116
Waiawa (lower ditch).....	980	192	83

# Inspection of Nursery Stock and Control of Insect Pests and Plant Diseases

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By E. M. EHRHORN, *Superintendent of Entomology.*

The rigid inspection and disinfection of nursery stock coming into the Territory is the first essential of clean horticulture. This has been recognized now by many countries and Hawaii was luckily one of the first to establish such laws with rules and regulations to enable this important work to be carried on in a businesslike manner. These laws are so formed that they protect the individual grower from the careless and oftentimes unscrupulous dealer and the community from the invasion of destructive pests of the field and garden.

When shipments of packages of fruit, plants, trees, bulbs or seeds arrive, either as freight or mail matter, the inspectors take full charge of the same and carefully examine all these shipments. The steamship companies hold all shipments until they have been inspected and passed by the inspectors. If, upon inspection, the fruit, plants, bulbs or seeds are found to be free from insect pests or plant diseases they are immediately passed and the transportation company notified. If, however, the shipment is found infested with insect pests or plant diseases not found in the Territory, the shipment, box and all, is immediately destroyed and the consignee is notified thereof and a certificate, stating the reason for destroying the shipment, is furnished him as a counter claim against the careless dealer. In case of fruit or vegetable shipments in large quantities, the consignee can return them to the original shipper if he so desires. If any shipment is found infested with pests already known to exist in the Territory, they are disinfected in such a manner that the insects or diseases are killed before the consignee can receive them.

The methods of disinfection vary for the various kinds of shipments. For all seeds, such as beans, peas, bulbs and garden seeds, carbon-bisulphide ("Highlife," as it is commonly called here) is used. Carbon-bisulphide is an ill-smelling liquid which is highly inflammable, producing by evaporation a very heavy gas, which is capable of penetrating into the tightest packing. To fumigate any seeds or bulbs it is necessary to have a tight compartment. The materials are placed in this and the carbon-bisulphide is poured into a shallow dish placed on top of the material to be fumigated. As the liquid evaporates the heavy gas descends to the bottom of the compartment and gradually rises until it covers all the material contained therein. The compartment,

which should be air-tight, should remain closed for from 24 to 48 hours, according to the condition of the material which is to be fumigated. The greatest care should be exercised in handling carbon-bisulphide, because it is very inflammable and no light or lantern should be used, nor should anyone be smoking while handling it. One pound of carbon-bisulphide is used for every 1000 cubic feet of space. Weevily beans or seeds, wormy tobacco, corn, wheat, or meal infested with beetles or moths, household furniture, carpets, furs, anything infested with wood borers or other vermin, can be freed by subjecting these to the fumes of carbon-bisulphide.

The best method for all forms of insect pests either attached to live plants or crawling about in the packing used in the shipments, is the hydrocyanic acid gas fumigation. This is also a very dangerous gas because it kills instantly everything it comes in contact with except plant life. Great care must, however, be taken, even with plants because if moist they will absorb a certain amount of the gas or cause it to precipitate on the moist spots and burning of the foliage and even of the tender wood will result. However, if the shipment is dry or is allowed to dry no bad effects are experienced.

Many people are ready to blame the inspector for damaging their plants by fumigation, but if they could see upon arrival the various shipments that are damaged before the inspector touches them they would realize that the greatest damage is done by the careless shipper of plants. We, here in Hawaii, are a long distance from other countries whence shipments of plants are made. If ordered from some point on the Atlantic Coast, for example, we can count on a three weeks' trip. If the necessary precaution is taken to thoroughly ventilate the shipments the plants will arrive in fairly good condition, but if poorly packed, usually too closely, and no ventilation to speak of, then we have a mass of decayed vegetation unrecognizable at times, and worthless to say the least. In small shipments, by mail from distant points, it is the reverse. The shipper usually sends a few plants packed in a flimsy cardboard box with a little moss which was once moist, about the roots, thinking that he is sending the plants to some nearby town, and upon arrival here the plants are as dry as old bones—absolutely worthless. The inference usually is that they were killed by the inspector here. The science of fumigation has reached such a state that the most delicate fern can be fumigated without turning a leaf, but it is all in knowing how to do it.

The disinfection of diseased plants, as far as horticultural inspection goes, is not at all satisfactory and generally diseased plants which are more or less worthless, are destroyed. For suspected cases of blight or rust on roses, dipping the plants in a strong solution of Bordeaux mixture will insure freeing them

from this trouble. Bordeaux mixture is made as follows: Dissolve 4 pounds of bluestone (copper sulphate) in a wooden tub in about 5 gallons of water. Slake 5 pounds of quicklime and thin it to a creamy whitewash. Pour the whitewash very slowly through a wire screen into the copper solution. Stir the mixture thoroughly and add enough water to make 25 gallons in all. Stir occasionally while dipping the plants as the material settles very easily. Never make the Bordeaux mixture in an iron or metal vessel as the copper will go to the iron and the effect of the wash is neutralized. Never allow the wash to stand over night. This remedy can be used as a spray for infected plants in the garden.

For black aphid on ferns a soap wash will give good results. Dissolve one pound of whaleoil soap in 4 gallons of hot water and when thoroughly dissolved spray the ferns with this hot solution, using a fine atomizing sprayer. The reason for applying the liquid warm is that the insects are greasy and the warm solution will cling to them better than a cold solution. This remedy is also effective for plant lice or scale insects attacking garden plants, such as roses, vegetables, etc., or potted house plants. The next day after spraying the plants can be washed off with warm water as a spray, or if in the garden, with the hose using a fine nozzle. The natural means of control, by the use of ladybugs and parasites, generally are sufficient to keep down these pests and it is only in severe cases, when climatic conditions are favorable to the increase of pests and unfavorable to the increase of the ladybug or parasite, that we need apply artificial remedies. In the house or conservatory, where these friendly insects are not found, we are forced to rely upon artificial remedies.

Cutworms, the larvae of owlet moths, give much trouble at times, especially to young plants, but if taken in time and either poisoned with poisoned bran bait or hunted in the soil and killed by crushing, they can be kept down to a minimum.

The Japanese rose beetle is another annoying pest and requires constant attendance if one cares for perfect flowers. This beetle during the wet season is not as abundant as during the dry season on account of being more easily attacked by the beetle fungus, which kills it very readily. Nevertheless, collecting beetles in the evening while they are feeding will do much for those who have small yards and are interested in their plants.

Whenever pests are found injuring plants it is best to procure specimens of the same and submit them to the Superintendent of Entomology who can then give the necessary advice for their destruction.

The fruit season is rapidly approaching and no doubt many peaches, mangoes and other fruits will be attacked by fruitfly. Thousands of parasites have been liberated in many sections of

the country and are doing good work in keeping down the fly. However, we must assist the parasites and instead of collecting fallen fruit and burning it and in that way not only destroying the maggots which are in the fruit, but with them also the grubs of the parasites contained in those maggots, it is best to collect all this fruit and pile it in a shady, out-of-the-way place under some bush. The fruit will decay and the maggots will crawl into the ground and a good per cent will furnish a new supply of parasites. Wherever this has been done a marked improvement has been noted. A little assistance in this way will insure the protection to the parasite in the future. We have reared parasites from many fruits gathered at different times and know that the parasites are present, so that with the assistance above noted, a marked increase in parasitism will result and better fruit will be produced.

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Currant and gooseberry bushes, which grow in all parts of the United States, are the host plants for the fungus of the white pine blister, and from these plants the disease spreads to the pines. The department of agriculture announces that a federal and state campaign is being waged against the further spread of this pest, which has already gained a foothold in the eastern states.

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Of two large shipments of lambs from the Wyoming national forest, one averaged eighty and the other eighty-four pounds per head on the scales at Omaha. The average weight of 50,000 head of April and May lambs from the Madison forest in Montana, after being shrunk for twelve hours, was 75.7 pounds each. From a band of 900 ewes grazed on the Beaverhead Forest, Montana, the owner raised and shipped 880 lambs which averaged 97 pounds per head after being driven fifty-five miles to the shipping point.

# The Treatment and Prevention of Sore-Head, or Chicken Pox, by Means of Vaccination.

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## INTRODUCTION.

Every poultry raiser in this Territory is familiar with the sores and tumors on the comb and wattles, and diphtheritic exudations in the eyes, nostrils and mouths of chickens, which characterize this disease. It is, therefore, not necessary here to discuss its nature or cause beyond stating that it is a highly contagious disease affecting chickens, turkeys and pigeons, and, to a much less extent, water fowl and guinea hens. When once the disease gains entrance to a flock it spreads quickly and since the infection is very resistant to disinfectants, it is difficult to eradicate it. The need for the immediate isolation of all diseased fowls from the flock, the removal and burning of all dead fowls, and the cleaning and disinfecting of the houses and yards, is apparent.

## TREATMENT.

The usual manner of treating sore-head is by removing the scabs or crusts as soon as they form, and then apply to the raw surface various chemical disinfectants, such as silver nitrate, copper sulphate, permanganate of potash or tincture of iodine. When the disease is of a mild form, and the birds fully grown and strong, this treatment at times serves to check it, but in most cases it is of doubtful value. It is, therefore, of great interest to all poultry raisers and fanciers that a new method of treatment has been found which seems to be very promising, both as a preventive and a cure. This treatment was first suggested in 1910 by a German scientist (Manteufel), but it was not until American investigators (Hadley and Beach, 1913; W. B. Mack, 1915, and J. R. Beach, 1915) had devoted much time and study to its development and standardization that the present method of preventive vaccination has been evolved.

## PREVENTIVE VACCINATION.

The principle of this treatment consists in the preparation of a vaccine from the crusts and scabs which form on the comb and wattles of the affected birds, and the injection of this vaccine beneath the skin of both affected and exposed birds. The method of preparation is very simple and can be undertaken by anyone who is in possession of a good dairy thermometer and understands the first principles of absolute cleanliness. But as many

poultry raisers will feel timid about injecting into valuable birds a solution which they know contains the disease germ, it may be safer for them first to learn to administer the vaccine and satisfy themselves of its beneficial effect, before they attempt to prepare it. For those who feel this way about it, the following is suggested.

#### COLLECTING AND FORWARDING SCABS FOR VACCINE.

Until such a time as poultry raisers in the Territory feel confident of the value of the vaccination treatment, the Territorial Veterinarian will prepare and, whenever possible, return by first mail the vaccine made from scabs forwarded to his office for this purpose.

When care is taken promptly to isolate all affected birds, the disease as a rule spreads slowly, and as it is necessary that a sufficient quantity of crusts or scabs should form in order to obtain material for the treatment of the entire flock, there is little danger of heavy losses even if four to six days will be required for the forwarding, preparation and return of the scabs and vaccine.

The best scabs, and in fact the only ones to use for vaccine, are those which form on the comb, wattles and the skin of the head. In no case use the exudate which forms in the eyes, nostrils or mouth. Place the scabs in a small bottle, previously cleaned with boiling water and drained until dry. At least one heaping teaspoonful of scabs will be required for the vaccination of a flock containing from 75 to 100 birds, but as this quantity provides for two injections, (the second injection following the first after five to seven days), it is not necessary that the entire amount should be forwarded at once. For a flock of 25 to 30 chickens, a much smaller quantity will suffice for the first injection, and as the treatment does not immediately stop the further development of sores or tumors, a sufficient quantity of scabs for the second treatment will usually develop during the interval between the two injections. The second crop should, therefore, be forwarded not more than five to seven days after the first was sent.

Wrap the bottle well and place it in a small box or mailing case plainly addressed to the Division of Animal Industry, Board of Agriculture and Forestry, Honolulu, and send it by special delivery. Full information concerning the number, class, breed and age of the birds to be treated must accompany the shipment, as well as plain instructions as to where the vaccine should be returned.

#### METHOD OF PREPARING THE VACCINE.

The method of preparing the vaccine, vaccination, precautions to be observed, and treatment, evolved by Dr. J. H. Beach of the University of California, and the ones which have been followed here, are substantially as follows: •

One-half gram of chicken-pox scabs to 100 cubic centimeters \* of physiological salt solution is the proportion used. The scabs are first weighed out and ground in a sterile mortar with a small amount of the sterile salt solution until they are pulverized. This material is then filtered through absorbent cotton into a sterile flask or bottle and the remainder of the salt solution poured through the filter so as to wash out as much of the pulverized material as possible. The flask is then stoppered, placed in a water bath and heated at a constant temperature of 55° Centigrade † for an hour. The vaccine is now ready for use. It is very essential that the vaccine be used as soon after preparation as possible. Since no preservative is used it will deteriorate if allowed to stand.

#### METHOD OF VACCINATION.

The vaccine is administered by injecting it beneath the skin with a hypodermic syringe. Two doses of one cubic centimeter each are given five to seven days apart. The most convenient place for administration is beneath the skin of the side under the right thigh, the skin at that point being comparatively free from feathers. The left wing is held back, the fowl laid on its left side, and the right wing and leg and feathers held back with the last three fingers of the left hand. The exposed skin is then cleansed with a piece of cotton saturated with disinfectant solution (2 percent solution of compound solution of cresol) and picked up with the thumb and forefinger of the left hand. Then with the right hand the syringe needle is inserted beneath the skin and the proper dose injected. A syringe of one cubic centimeter capacity is well suited for this work, when small flocks are to be treated. (Ask your druggist for Cutter's Tuberculin Syringe.)

#### PRECAUTIONS TO BE OBSERVED.

1. The vaccine being in an unpreserved condition will soon decompose and become unfit for use. Therefore, if possible, it should be used within three days. If old, decomposed vaccine is used bad results will follow.
2. Vaccine should be kept in a cool place, on ice if practicable, until used and only one bottle opened at a time.
3. A small, wide-mouthed, covered vessel, such as a quarter-pint milk bottle or a jelly-glass, should be provided as a vaccine container from which to fill the syringe. This should be sterilized by boiling before it is used and should be kept covered at all times except when the syringe is being filled.
4. The syringe should be sterilized by boiling, or by soaking for several minutes in a ten per cent solution of compound solution of cresol, followed by rinsing with boiled water.

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\* One cubic centimeter—approximately 15 drops.

† 55° centigrade—131° Fahrenheit.



5. All diseased fowls should be removed from the flock and treated.

6. The immunizing effect of the vaccine does not take place immediately; therefore, the fowls already infected at the time of vaccination or soon after will, in most cases, develop chicken-pox lesions. Such cases are usually very mild and will soon recover if the fowls are removed from the flock and the lesions treated.

7. The hypodermic needle should be inserted *just under the skin* and not in the muscle.

#### TREATMENT.

Of the various kinds of disinfectants recommended for the treatment of this disease *tincture of iodine* has been found to be the most satisfactory. The scabs which form on the sores of the comb, wattles or skin should be removed with a dull knife or with the nails, and tincture of iodine applied to the exposed surface.

Collections of exudate on the mucous membrane of the mouth should be removed with forceps or a scoop and the exposed membrane treated with tincture of iodine. All collections of exudate within the eyelids can usually be removed by pressing with the thumb and finger tips around the eye. If any of the exudate should adhere to the eye it should be removed with forceps and it may sometimes be necessary to use forceps also in removing the exudate from beneath the third eyelid at the inner corner of the eye. Afterwards drop a small amount of tincture of iodine into the eye.

The tincture of iodine can be applied most conveniently in all cases with a medicine dropper. Treatment should be repeated as often as the scabs or exudate reform. Any fowl that does not show a marked improvement in condition after three or four treatments will usually recover very slowly. In such cases, unless the fowl be very valuable for show, breeding or other purposes, it is more economical to destroy it than to give further treatment.

Collections of exudate within the nasal cavities always produce marked swellings of the face. This condition is relieved by making an incision through the skin over the swelling, removing all the exudate with a pair of forceps or scoop, and then packing the cavity with absorbent cotton saturated with tincture of iodine. The cotton pack is necessary to keep the incision through the skin from healing too rapidly. If not packed, the wound will quickly heal, the exudate reform, and no benefit be derived from the operation. The pack also assists in controlling the hemorrhage, which is always severe. When the hemorrhage is unusually severe, it should be checked by the application of a strong caustic, such as silver nitrate. The cotton pack should be removed, the wound cleansed and a new pack put in every two or three days as long as the exudate continues to form. When, upon removal of the

pack, it is found that no exudate has formed, the pack may be left out and the wound allowed to heal. The administration of vaccine in addition to local treatment will shorten the course of the disease and decrease the mortality from all types of the disease.

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**BY AUTHORITY.**

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**TERRITORY OF HAWAII.**

**BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.**

**RULE II. DIVISION OF FORESTRY.**

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The Board of Commissioners of Agriculture and Forestry hereby makes the following rule and regulation for the preservation and administration of forest reserves:

Section 1. The following acts are hereby forbidden on government lands in forest reserves of the Territory of Hawaii and declared to constitute trespass punishable by fine:

(a) The cutting, killing, destroying, girdling, chopping, injuring or otherwise damaging, or the removal, of any timber, young tree growth, or any other material, except as authorized by permit from the Superintendent of Forestry.

(b) The grazing of any livestock, except as authorized by permit from the Superintendent of Forestry.

(c) The hunting of any wild animals, except as authorized by permit from the Superintendent of Forestry.

(d) Having or leaving in an exposed or insanitary condition camp refuse or debris of any description, or depositing or being or going thereon and depositing in the streams or other waters within or bordering upon government lands in the forest reserves any substance or substances which pollute or are liable to cause pollution of the said streams or waters.

(e) The going on or being upon government lands within a forest reserve with intent to destroy, molest, disturb, or injure property belonging to the Territory of Hawaii, or used by the Territory of Hawaii in the administration of the forest reserves.

(f) The wilful tearing down, defacing, or disturbing of any public notice or survey monument posted within a forest reserve.

(g) Squatting upon government land in a forest reserve, or constructing or maintaining any kind of works, structure, fence, inclosure, road or trail, without a permit, except as otherwise allowed by law.

(h) The tearing down, breaking down or through, or molesting in any manner of a forest reserve boundary fence or gate or a fence or gate on government land within a forest reserve.

Section 2. Any person violating the above rule shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to exceed five hundred dollars (\$500.00), as provided by Section 529, Revised Laws of Hawaii of 1915.

Section 3. This rule shall take effect upon its approval by the Governor.

Approved:

LUCIUS E. PINKHAM,

Governor.

Honolulu, Territory of Hawaii, April 5, 1916.

## TERRITORY OF HAWAII.

## BOARD OF COMMISSIONERS OF AGRICULTURE AND FORESTRY.

**RULE III. DIVISION OF FORESTRY.**

The Board of Commissioners of Agriculture and Forestry hereby makes the following rule and regulation for the purpose of protecting from contamination the drainage areas tributary to the Honolulu water supply system in Nuuanu Valley, within the Honolulu Watershed Forest Reserve:

Section 1. All persons, except forest rangers and other persons employed by the Territory of Hawaii, by the City and County of Honolulu, by the United States, and by telephone and electric companies, in the discharge of their duties, are hereby prohibited from trespassing, and all persons are hereby prohibited from allowing any stock to graze, upon that portion of the Honolulu Watershed Forest Reserve, herewith described, to-wit:

Beginning at the Government Survey Trig. Station "Pali (New)" above the Nuuanu Pali Road, as shown on Government Survey Registered Map No. 2554, and running:

1. In a Southeasterly direction along the summit of the Koolau Range to the junction of Nuuanu and Manoa Valleys at a peak called Konahuanui;

2. Thence Southwesterly down the dividing ridge between Nuuanu and Manoa Valleys to the Government Survey Trig. Station "Kaumuhonu" on the peak of that name;

3. Thence still Southwesterly down the dividing ridge between Nuuanu and Pauoa Valleys, to a prominent peak in said ridge about 3000 feet Southwest of Kaumuhonu;

4. Thence Northwesterly down a well defined lateral ridge to the edge of a deep gulch, across said gulch, over and across grass land, to the Luakaha Falls, the boundary being, however, a direct line from the top of the peak described in Course 3 to the Luakaha Falls;

5. Thence down said falls and the middle of Nuuanu stream to its junction with an angle in the boundary of Grant 4561, Sec. 2 (Luakaha of C. M. Cooke);

6. Thence Northeasterly and Northwesterly along the mauka boundary of Grant 4561 (Luakaha of C. M. Cooke) and across the Nuuanu Pali Road to the Northwest or Ewa side of said road;

7. Thence Southwesterly down along the Northwest or Ewa side of said road to its intersection with the mauka boundary of Grant (P. W.) 7 to J. A. McCandless;

8. Thence along the mauka boundaries of Grant (P. W.) 7 to J. A. McCandless, Grant 5476 to A. Lewis, Jr., Grant (P. W.) 45 to A. Lewis, Jr., and across the old Nuuanu Pali Road to the East corner of Grant 6028 to J. R. Galt;

9. Thence along the mauka and Ewa boundaries of Grant 6028 to J. R. Galt, Grant 5572 to A. F. P. McIntyre, et al., Grant 5552 to Charlotte A. Carter, et al., Grant (P. W.) 42 to A. L. C. Atkinson, Deed of Kamehameha III to Niniko dated June 15, 1854, and recorded in Liber 26, p. 53, to the Waolani Ridge and along said ridge to the dividing ridge between Nuuanu and Kalihi Valleys;

10. Then Northeasterly along the dividing ridge between Nuuanu and Kalihi Valleys to the main Koolau Ridge;

11. Thence Easterly along the summit of the Koolau Range to the point of beginning.

Sec. 2. This prohibition shall not apply, however, to the use of the main government road for the purpose of travel and transportation within the area described in Section 1.

Section 3. Any person violating the above rule shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine not to exceed five hundred dollars (\$500.00) as provided by Section 529, Revised Laws of Hawaii of 1915.

Section 4. This rule shall take effect upon its approval by the Governor.

Approved:

LUCIUS E. PINKHAM,

Governor of Hawaii.

Honolulu, Territory of Hawaii, March 31st, 1916.

### **FOREST RESERVE HEARING.**

#### **DISTRICT OF HONOLULU, ISLAND OF OAHU.**

Notice is hereby given that under the provisions of Chapter 37 of the Revised Laws of Hawaii of 1915, a public hearing will be held by the Governor of the Territory and the Board of Commissioners of Agriculture and Forestry on Monday, the 24th day of April, at 2 o'clock p. m., in the office of the Board of Commissioners of Agriculture and Forestry, Government Nursery, King street, in the City and County of Honolulu, to consider the setting apart as a forest reserve, to be known as the Manoa Ranger Station, of a portion of the government land of Kahoiwai, in Manoa Valley, District of Honolulu, Island of Oahu, having an area of 15.36 acres.

A map and description of the said land to be set apart as a forest reserve are on file in the office of the Superintendent of Forestry, in Honolulu, where they are open to the inspection of the public.

At the said time and place all persons who so desire will be given full opportunity to be heard upon the subject matter of this notice and to present evidence and arguments in person, by proxy, or by letter, either for or against the setting apart of said land as a forest reserve.

LUCIUS E. PINKHAM,

Governor of Hawaii.

The Capitol, Honolulu, April 5th, 1916.

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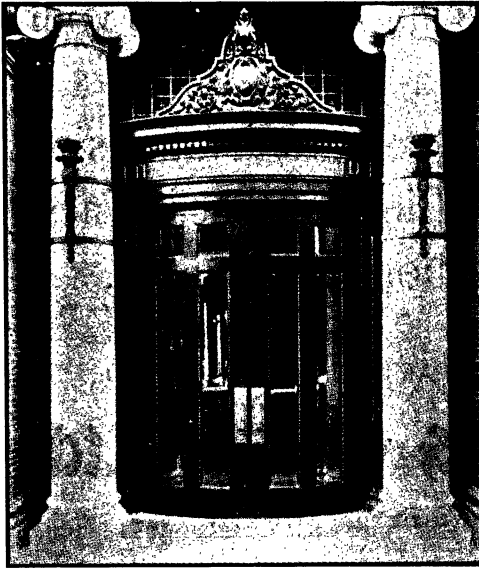
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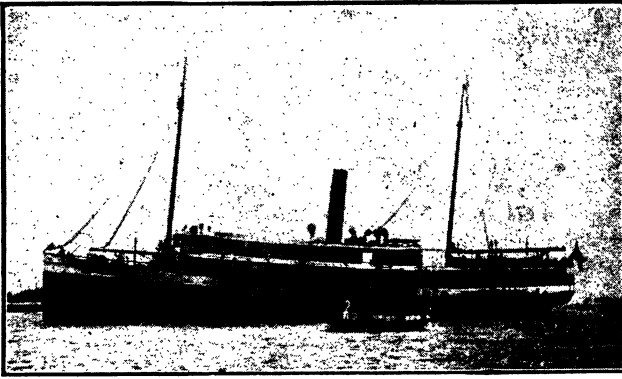
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